CLAIMS

WE CLAIM:

1. An air turbine starter, comprising:

a starter housing adapted to couple to a gearbox assembly, the starter housing including a supply opening and an exhaust opening, each configured to provide fluid communication between the gearbox assembly and the starter housing;

a receptacle coupled to the starter housing proximate the supply opening to thereby define a reservoir;

a first valve disposed within the reservoir and configured to open or close the supply opening in response to a pressure differential between the starter housing and the gearbox assembly; and

a second valve coupled to the starter housing proximate the exhaust opening and configured to open or close the exhaust opening in response to the pressure differential between the starter housing and the gearbox assembly.

2. The air turbine starter of claim 1, wherein the first and second valves each comprise:

a valve flexure, at least a portion of which is coupled to the starter housing, the valve flexure configured to selectively move between a valve open and valve close position in response to the pressure differential between the starter housing and the gearbox.

3. The air turbine starter of claim 2, wherein the valve flexure has a curve, wherein the curve curves away from the starter housing.

4. The air turbine starter of claim 3, further comprising:

a stop coupled to the starter housing and configured to provide a biasing force on the valve flexure to bias the valve flexure in an open position.

5. The air turbine starter of claim 3, further comprising:

a stop coupled to the receptacle and configured to provide a biasing force on the valve flexure to bias the valve flexure in an open position.

6. The air turbine starter of claim 2, wherein the valve flexure comprises a leaf spring.

7. The air turbine starter of claim 2, wherein the valve flexure comprises spring steel

8. The air turbine starter of claim 2, further comprising:

a first and a second valve seat each coupled to the starter housing concentric to the supply and exhaust openings and configured to selectively contact each of the valve flexures to provide a leak tight seal when the valve flexures are in the valve close position.

9. The air turbine starter of claim 8, wherein at least a portion of the valve seat configured to contact the valve flexure includes sharp edges.

10. The air turbine starter of claim 1 wherein the receptacle comprises a standpipe.

11. The air turbine starter of claim 1, further comprising:

a supply line in fluid communication with the reservoir, the supply line configured to supply fluid from the gearbox to the starter housing.

12. The air turbine starter of claim 11, wherein the fluid supply line is further configured to supply a continuous flow of fluid from the gearbox to the starter housing.

13. A check valve assembly for placement proximate an opening in a wall separating a first environment and a second environment, the check valve assembly comprising:

a valve flexure, at least a portion of which is coupled to the wall proximate the opening and configured to selectively move between a valve open and valve close position in response to the pressure differential between the first and second environments; and

a valve seat coupled to the wall concentric to the opening and configured to selectively contact the valve flexure to provide a leak tight seal when the valve flexure is in a close position.

14. The check valve assembly of claim 13, wherein the valve flexure comprises a leaf spring.

15. The check valve assembly of claim 13, wherein the valve flexure comprises spring steel.

16. The check valve assembly of claim 13, wherein the valve flexure comprises rubber.

17. The check valve assembly of claim 13, further comprising:

a stop coupled to the receptacle and configured to provide a biasing force on the valve flexure to bias the valve flexure to the open position.

18. The check valve assembly of claim 13, further comprising:

a stop coupled to the wall and configured to provide a biasing force on the valve flexure to bias the valve flexure in an open position.

19. The check valve assembly of claim 13, wherein at least a portion of the valve seat configured to contact the valve flexure includes sharp edges.

20. A system for providing fluid between a gearbox and an air turbine starter, the system comprising:

a starter housing positioned between and adapted to couple to a gearbox assembly and air turbine starter, the plate including a supply opening and an exhaust opening, each configured to provide fluid communication between the gearbox assembly and the air turbine starter;

a receptacle coupled to the starter housing proximate the supply opening to thereby define a reservoir;

a supply line in fluid communication with the reservoir, the supply line configured to supply fluid from the gearbox to the starter housing;

a first valve disposed within the reservoir and configured to open or close the supply opening in response to a pressure differential between the starter housing and the gearbox assembly; and

a second valve coupled to the starter housing proximate to the exhaust opening and configured to open or close the exhaust opening in response to the pressure differential between the starter housing and the gearbox assembly.

21. The system of claim 20, wherein the fluid supply line is further configured to supply a continuous flow of fluid from the gearbox to the starter housing.

22. The system of claim 20, wherein the first and second valves each further comprise:

a valve flexure having first and second sides, wherein the first side is coupled to the starter housing and the second side is configured to selectively move between a valve open and valve close position in response to the pressure differential between the starter housing and the gearbox.

23. The system of claim 22, wherein the valve flexure comprises a leaf spring.

24. The system of claim 22, wherein the valve flexure comprises spring steel.

25. The system of claim 22, wherein the valve flexure comprises rubber.

26. The system of claim 22, further comprising:

a valve seat coupled to the starter housing concentric to the opening and configured to selectively contact the valve flexure to provide a leak tight seal when the valve flexure is in a close position.

27. The system of claim 26, wherein at least a portion of the valve seat configured to contact the valve flexure includes sharp edges.

28. The system of claim 22, further comprising:

a stop coupled to the receptacle and configured to provide a biasing force on the valve flexure to bias the valve flexure to the valve open position.

29. The system of claim 22, further comprising:

a stop coupled to the starter housing and configured to provide a biasing force on the valve flexure to bias the valve flexure in an open position.